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LETTER AND THE U S NAVY RESPONSE TO THE U S EPA REGION III COMMENTS ON  
THE DRAFT FOCUSED FEASIBILITY STUDY FOR GROUNDWATER SOLID WASTE  
MANAGEMENT UNIT 3 (SWMU 3 ) PIER 10 SANDBLAST YARD JEB LITTLE CREEK  
VIRGINIA BEACH VA  
09/18/2014  
CH2M HILL



**CH2MHILL**

**CH2M HILL**  
5701 Cleveland Street  
Suite 200  
Virginia Beach, VA 23462  
**Tel 757.671.8311**  
**Fax 757.497.6885**

September 18, 2014

Environmental Protection Agency  
Attn: Mr. Jeffrey Boylan  
1650 Arch Street  
Philadelphia, PA 19103

Subject: Response to Comment: *Draft Focused Feasibility Study, SWMU 3 – Pier 10 Sandblast Yard*, Joint Expeditionary Base Little Creek, Virginia Beach, Virginia

Dear Mr. Boylan:

On behalf of the Navy, CH2M HILL is pleased to submit the following response to the comments on the *Draft Focused Feasibility Study, SWMU 3 – Pier 10 Sandblast Yard*, Joint Expeditionary Base Little Creek, Virginia Beach, Virginia:

#### **Hydro Comments**

##### **Comment 1: Section 1.6**

It is stated here that “The groundwater in the surficial aquifer beneath SWMU 3 is generally brackish, and is within a transition zone where upgradient fresh water mixes with downgradient seawater. The shallow groundwater is not currently used and is not expected to be used as a potable water supply. Potable water is provided to the Base and surrounding communities by the City of Virginia Beach.”

However, the term ‘generally brackish’ is not defined. It is not clear if the intention is to infer that the groundwater is not potential potable supply. Using EPA’s Guidelines for Groundwater Classification, unless the groundwater has 10,000 mg/L TDS, it would still be considered a potable water supply. Although it is not currently used as a potable water supply, it still has the potential for being used as such and is subject to EPA’s expectation to return groundwater to its beneficial use.

**Response:** The sentence has been revised to read: “The groundwater in the surficial aquifer beneath SWMU 3 is generally brackish [salinity ranging from 0.5 to 30 parts per thousand (ppt)]. Salinity measurements collected during August 2014 groundwater sampling indicated salinity across the site ranging from 0.42 ppt in MW08 located behind a bulkhead wall to 17.14 ppt in MW02 located adjacent to the rip-rap shoreline (**Appendix A, Table A-2**). The brackish nature of the groundwater underlying SWMU 3 is indicative of a transition zone where upgradient fresh water mixes with downgradient seawater.” The discussion regarding the generally brackish nature of the groundwater was intended to provide evidence of the interconnection between the groundwater and the adjacent Little Creek Harbor. Per the referenced USEPA Guidelines for Groundwater Classification, USEPA does not allow for potable use of groundwater characterized as having a high-to-intermediate degree of interconnection with an adjacent surface water body. According to the guidance, “high interconnection is assumed to occur...where groundwater discharges into adjacent surface waters”. However, although USEPA would not classify groundwater at SWMU 3 as a potable

source, the Commonwealth of Virginia considers all groundwater as a potential potable source. As such, the expectation is to return groundwater at SWMU 3 to beneficial use is the most practicable way with consideration for the conceptual site model.

#### **Comment 2: Section 1.6.1**

It is stated here that “The maximum concentration of parent product PCE (210 micrograms per liter) was detected in upgradient monitoring well LW03-MW06 in 2002 (Figure 4); however, PCE was not detected above the MCL during two rounds of subsequent sampling in 2007.” It should also be noted that LW03-MW-12 had 260 ppb cis-1,2,-DCE, 17 ppb TCE, 79 trans-1,2,-DCE and 56 ppb vinyl chloride in 2007 and that both of these wells have not been sampled since then. These findings should have indicated that the monitoring network and understanding of potential sources were not well understood. This is corroborated by the statement “No specific source for the VOCs has been identified at the site.”

It is noted that “SVOCs were detected in one monitoring well (LW03-MW04) in 1998, and were not sampled for during subsequent site investigations.” Why were SVOCs not included in subsequent sampling rounds?

It is then stated that “Detected soil concentrations of VOCs, SVOCs, and metals do not indicate that any continuing source of contamination is present in the site soil.” In the previous statement is noted that no specific source for the VOCs has been identified at the site. Perhaps since the source has not yet been identified; there still may be a source in the site soils.

**Response:** Section 1.6.1 has been updated to include discussion of three rounds of pre-FS groundwater data collected in January and September 2008, and August 2014. VOC groundwater data has been provided in Appendix A and a Figure depicting VOC MCL exceedances has been included as Figure 4. The extent of VOCs in groundwater has been adequately characterized.

The discussion regarding SVOCs has been revised to acknowledge that dibenzofuran was detected above screening values during the SI however was determined to not be site-related and therefore not sampled for during the RI and SRI. Additionally, the text was updated to note that during January and September 2008 pre-FS sampling all monitoring wells were analyzed for dibenzofuran and the constituent was not detected.

The statement “No specific source for the VOCs has been identified at the site” was not intended to imply that the potential source of VOC at the site had not been characterized, rather that the source had been adequately investigated and none identified. It is not uncommon to find small isolated plumes with no clear source. The site history has been extensively reviewed and no known release of VOCs has occurred. Through the SI, RI, and SRI which included soil, groundwater (DPT and monitoring well sampling), and MIP investigations, it was concluded that no remaining source of VOCs was present in soil (see Section 5 of the SRI). Soil, DPT, monitoring well, and MIP data all indicate the highest concentrations of VOCs are present in the northwest corner of the fenced area, in the vicinity of LW03-MW12, with the groundwater plume extending to and discharging to Little Creek Harbor. A figure providing all terrestrial sample locations has been added to the FFS as Figure 3. The sentence was revised to read: “Based upon the results of soil, groundwater and membrane interface probe sampling conducted as part of the SI, RI, and SRI, no specific source for the VOCs has been identified at the site.”

#### **Comment 3: Section 1.6.2**

It was stated in the previous paragraph that “Total and dissolved metals have been detected in groundwater above background values across the site during each site investigation.” Yet in this

section regarding fate and transport of groundwater contamination, only dissolved VOCs are discussed. Please discuss why the inorganics are not considered groundwater contaminants.

It is then stated that natural attenuation of VOCs through reductive dechlorination is occurring at the site with the primary evidence that natural attenuation is occurring at the site is the reduction in parent compound concentrations and the increase in degradation products. The following conclusion is made: "The presence of PCE in groundwater in 2002 and its general absence in 2007, in addition to the decrease in TCE concentrations from 2002 to 2007, coupled with the presence of degradation products cis-1,2-DCE and vinyl chloride in 2007 indicates that natural attenuation through reductive dechlorination is occurring." This conclusion is based on two sampling times, 2002 and 2007 and two of the wells were only sampled in 2007. This is an insufficient data set for trend analysis in determining the efficacy of natural attenuation processes to achieve ARARs (i.e. MNA).

Furthermore, the complete mineralization to innocuous end-products does not occur. Vinyl chloride is present in several of the wells. Thus the statement "Additionally, because degradation to vinyl chloride is evident at SWMU 3, and vinyl chloride degrades under both aerobic and anaerobic conditions, complete degradation to innocuous end products is expected at the site without the need for enhancement" is not justified.

**Response:** As a result of the HHRA conducted as part of the SRI antimony, arsenic, iron, manganese, and thallium were identified as potential risk drivers (individual cancer risks  $>10^{-6}$  contributing to a cumulative risk  $>10^{-6}$ ; and/or individual HI  $>0.1$  contributing to a target organ effect  $>1$ ) as shown on Table 2. Following a subsequent review of the HHRA and updated risk screening levels, MCLs, and toxicity values as part of development of the FFS and as discussed in Section 1.6.4 of the FFS, chromium and cobalt were also identified as site COPCs (maximum detected concentration exceeded their respective RSL). Risk management considerations for antimony, arsenic, chromium, cobalt, iron, manganese, and thallium have been added as Table 3 of the FFS. This discussion will be added in more detail to Section 1.6.4 of the FFS. Additionally, two rounds of pre-FS sampling, including analysis of thallium, was conducted in 2008 and results indicate thallium is not present in groundwater at SWMU 3. Discussion of this pre-FS data will be included in the FFS. Because metals do not drive risk at the site, discussion of these constituents in Section 1.6.2 has been omitted.

Ethene was detected at a low concentration ( $8.0 \times 10^{-4}$  J mg/L) in LW03-MW12 in January 2007 where the highest concentrations of VOCs has been detected. Although innocuous end products may not be prevalent at the site, it should be considered that as degradation occurs, mobilization of subsequent degradation products increases; therefore, vinyl chloride is likely to discharge to Little Harbor prior to its end product degradation. Degradation in the upgradient portion of the plume is evident. The advection and subsequent discharge to a surface water body of more mobile degradation products is also a component of the physical processes associated with natural attenuation. Section 1.6.2 has been revised to include a discussion regarding natural attenuation including discussion of geochemical data collected as part of the January 2007 SRI and August 2014 pre-FS sampling. Additionally, a trend analysis was conducted and is discussed in Section 1.6.2 and provided in Appendix D. Because the plume direct discharge to Little Creek Harbor, with no impacts to the water body, evaluation of the potential transport of the plume over time is not necessary and has not been included.

#### **Comment 4: Section 1.6.4**

It is stated here that "Risks and hazards associated with future resident exposure to indoor air via vapor intrusion from groundwater were calculated using groundwater data collected in 2007... and based upon the CSM, are likely an overestimation of site risks under current site conditions (due to

subsequent contaminant degradation and migration).” Since data illustrating the distribution of contamination in time and identification of a potential source or source area are not available and the data are seven years old, there is not supporting evidence to make this claim regarding current site conditions.

**Response:** It is acknowledged that the data used in this evaluation is 7 years old; however, as discussed in the *Final Risk Assessment Update - Vapor Intrusion Evaluation, SWMU 3, Joint Expeditionary Base Little Creek, Virginia Beach, Virginia* (June, 2013) there are no existing pathways for vapor intrusion at the site. Therefore, based upon the aforementioned site characterization efforts (i.e no continuing source and natural attenuation processes in effect), there is no reason to assume that use of this data would be an underestimation of potential future risks from vapor intrusion if a building were to be constructed at the site or existing building use change. Furthermore, VOC data collected in August 2014 confirm that current site conditions are similar to the calculated 95% UCL values used to evaluate CTE risk. The last sentence of Section 1.6.4 was revised to read: “Additionally, maximum-detected constituent concentrations and calculated 95 percent UCL of the mean concentrations were representative of site conditions in 2007. Based upon groundwater VOC data collected in August 2014, concentrations of VOCs have decreased to concentrations generally similar to the calculated 95 percent UCL values used in the risk assessment. Therefore, the Navy and USEPA, in consultation with VDEQ agree no action is warranted to address vapor intrusion at SWMU 3.”

**Comment 5: Section 2.2.**

It is stated here that “The only media of concern being addressed by this Focused FS is shallow groundwater based on potential future unacceptable carcinogenic risks and non-cancer hazards to human health. The RAO is to prevent exposure to groundwater until concentrations allow for unlimited use and unrestricted exposure.” This is unacceptable. The aquifer is a Class IIB aquifer and it is EPA’s expectation to return it to beneficial use, per the NCP. Furthermore, the NCP specifically precludes the use of institutional controls as a sole means of remediating groundwater when a more active remedy is practicable.

**Response:** A second RAO has been added as follows: “Monitor the natural attenuation of groundwater COCs until concentrations allow for unlimited use and unlimited exposure.”

**Comment 6: Section 2.5**

One of the three general response actions for this SWMU is “Monitoring - Relies on natural attenuation to reduce contaminant concentrations without performing any other measures.” This is not an acceptable response action. Monitoring is not an action. The description here is for MNA and a MNA demonstration has not been provided. Thus this response action should be omitted from the document.

**Response:** Natural attenuation has been demonstrated with site data. General response action will be revised to “Natural Attenuation - Relies on natural attenuation to reduce contaminant concentrations without performing any other measures”.

**Comment 7: Section 3.2.2**

It is stated here that “Although no longer present in groundwater above the MCL and not considered a COC at SWMU 3, the parent chlorinated VOC detected at SWMU 3, PCE, typically biodegrades via reductive dechlorination. As discussed in Section 1.6.2, groundwater data indicate that natural attenuation through reductive dechlorination is taking place at SWMU 3.” The data

collected are not consistent with those needed for a MNA demonstration and are at least 7 years old.

A proper evaluation of MNA has not taken place. Estimated time frames for contaminant reduction need to be evaluated against more remedies. The only timeframe presented was “for cost estimating purposes it has been assumed natural attenuation of COCs to PRGs will take 30 years”. For MNA, appropriate monitoring needs should be evaluated and not based on “for cost estimating purposes it is assumed groundwater monitoring will be conducted once every five years in conjunction with the statutory Five-Year Review to monitor the concentrations of COCs in groundwater until PRGs have been met.”

**Response:** See previous responses for demonstration of both biodegradation and physical processes of natural attenuation occurring at the site. Trend analysis and an evaluation of the timeframe to reach cleanup levels via MNA at the site has been added to the FFS. Because there is no risk of contaminants migrating downgradient beyond a LUC boundary and discharge to the surface water body does not pose potential risks, the need for more frequent groundwater monitoring beyond that conducted to evaluate remedy effectiveness and protectiveness in the five-year review is not warranted. The frequency of sampling has not been revised. The sentence has been revised to read: “Because there are no potential risks to downgradient users, it is assumed groundwater monitoring will be conducted once every five years...”. Additional monitoring may include evaluation of groundwater geochemistry and TDS, groundwater flow direction, and groundwater flow rate. Analysis of geochemical parameters has been added to the cost estimate.

#### **Comment 8: Section 3.3**

These response actions do not meet the threshold criteria of meeting ARARs. This document must be rewritten to be consistent with the NCP and EPA policy.

**Response:** See previous responses. Based on the conceptual site model and changes proposed, it has been demonstrated that Alternative 2 meets the threshold criteria and complies with ARARs. It is the intent to return groundwater to beneficial use, and cleanup levels have been established to meet ARARs. The continued effectiveness and protectiveness of the remedy will be monitored and if the remedy is determined to not be protective of human health and the environment, the appropriate measures will be taken through the five year review process. No changes to the document were made.

#### **Tox Comments**

##### **Comment 1: PAGE 4**

The first paragraph on this page provides “evidence that natural attenuation is occurring at the site.” I defer to the hydro assigned to the site regarding the strength of this argument.

The last paragraph on this page acknowledges that “future potable use of shallow gw may result in unacceptable cancer risks and non-cancer hazards for future industrial workers and hypothetical future residents.” However, the report concludes that “no further action to address these constituents in gw is warranted.” According to the report, this conclusion is based on the following factors: calculated risk levels, frequency and magnitude of detected concentrations, and comparison of chemical concentrations to bg conditions (metals only). While the Tier 1 team may feel justified in its decision, ignoring projections of unacceptable risk due to gw contamination is rarely condoned by EPA and should be approached with great caution. Based on concerns regarding the source of VOC contamination, plume delineation and gaps in gw data, this conclusion should be

re-evaluated, pending a better understanding of current site conditions and the extent of contamination.

**Response:** See responses above regarding site characterization. An additional round of groundwater VOC data was collected in August 2014 to evaluate current site conditions and potential risks. It is not the intent of the Tier I Team to ignore potential future unacceptable risks at the site. Table 3 has been added and presents risk management considerations for those constituents where risk management is warranted. Based upon the results of the revised August 2014 risk assessment, PRGs have been developed for those remaining constituents identified as site COCs (TCE and vinyl chloride). Based upon the conceptual site model, including the physical and biological attenuation processes occurring at the site, as well as the lack of potential downgradient receptors, the full evaluation of treatment alternatives was determined to not be the most practicable solution for addressing site risks. Rather, the FFS proposes monitored natural attenuation couple with LUCs until cleanup goals have been met and site conditions allow for unlimited use and unrestricted exposure (i.e. beneficial reuse).

**Comment 2: PAGE 5**

Dissolved cobalt is eliminated as a Contaminant of Concern because observed concentrations exceeded the background UTL in only 6 out of 36 samples (roughly 17 percent of the time). Were these exceedances in upgradient wells? If not, this justification is weak.

In the paragraph explaining the VI evaluation performed for this site, the report should identify any buildings within 100 feet of MCL exceedances in gw. If buildings are located within this footprint, an explanation should be provided for not collecting subslab vapor, indoor air and outdoor air samples. Further, any provisions for addressing VI if future conditions change (such as construction of an on-site structure or occupancy of existing buildings) should be mentioned in this paragraph.

**Response:** Cobalt was detected in exceedance of background at monitoring wells LW03-MW06, LW03-MW09, LW03-MW12, LW03-MW14, and LW03-MW15. With the exception of LW03-MW12, cobalt exceedances of background were detected in monitoring wells upgradient or side-gradient of the former sandblasting area. Detections of total and dissolved cobalt in LW03-MW12 (4.9 ug/L and 4.7 ug/L, respectively), located within the former sandblasting facility, only slightly exceeded their respective background UTLs of 2.6 ug/L and 1.9 ug/L. Additionally, concentrations are below the maximum detected background values of total and dissolved cobalt (21.5 ug/L and 12.2 ug/L, respectively). Therefore, cobalt in groundwater is not likely the result of former site activities. It should be noted that cobalt was not identified as a site COC following the SRI HHRA. As part of the Focused FS, data were screened against revised RSL values to identify and new COPCs. Cobalt was identified as a potentially new COPC but risk was not calculated. The risk management considerations presented are conservatively assuming that cobalt concentrations would pose potentially unacceptable risk.

As discussed in the *Final Risk Assessment Update - Vapor Intrusion Evaluation, SWMU 3, Joint Expeditionary Base Little Creek, Virginia Beach, Virginia* (June, 2013) there are no existing pathways for vapor intrusion (i.e. no occupied buildings within 100 feet of the plume) at the site; therefore soil gas, subslab, and indoor air sampling was not warranted for the site. VOC data collected in January and September 2007 as part of the SRI were utilized to assess potential future risk if building use were to change or new construction were to take place. Results of this evaluation concluded, that although calculated risks based upon maximum detected concentrations in groundwater are above USEPA's acceptable carcinogenic risk range of 10<sup>-4</sup> to 10<sup>-6</sup> and non-carcinogenic hazard level of 1; calculated risks based upon 95 percent UCL values, an estimate that may be more representation of an RME scenario

consistent with the goal of USEPA RAGs (USEPA, 1989), are below USEPA's acceptable thresholds. Additionally, maximum-detected constituent concentrations and calculated UCL values are representative of site conditions in 2007. Data collected in August 2014 indicate current concentrations of VOCs in groundwater are similar to the calculated UCL values. No further action for vapor intrusion was recommended. Additional text was added to Section 1.6.4 of the FFS to clarify the results of this evaluation.

**Comment 3: PAGE 7**

Section 2.4 of the report indicates that no unacceptable risks were identified from exposure to indoor air at the site. However, page 5 of the report states that VI risks from VOCs in gw do, in fact, pose potentially unacceptable risks (based on maximum concentrations detected in gw). The text on page 7 should be clarified to reflect this.

**Response:** See response to Tox Comment 2 above. The vapor intrusion assessment concluded that no action was warranted for indoor air. The discussion in Section 1.6.4 on page 5 has been updated to better present the conclusions of this risk assessment and include discussion of August 2014 data.

**Comment 4: PAGE 8**

Regarding Alternative 2 (Natural Attenuation and Land-Use Controls), I defer to the hydro with regard to whether site conditions support this. Additionally, in instances where natural attenuation is selected as a gw remedy, it is accompanied by long-term monitoring and, typically, enhancements to stimulate attenuation.

**Response:** It is the intent that a monitoring program will be developed to assess the continued natural attenuation of COCs at the site. Enhancement of any kind to stimulate attenuation would be considered treatment. No changes to the document were made.

**Comment 5: TABLE 2**

The calculation of gw Exposure Point Concentrations (EPCs) in the RI for this site incorporated data from all wells. At that time, I commented that Regional policy is to focus on only the most contaminated wells when establishing EPCs for the risk assessment. However, since risks were already in the unacceptable risk range (thus, triggering the need for action), increasing EPCs by following Regional guidance would have just confirmed the conclusions of the RI. I raise this point again, only because the EPCs presented in this table, as well as their associated potential risks, are higher than the table implies.

PCE seems to have been inadvertently omitted from the table for future adult residents (ingestion and inhalation). The table should be revised to include these risks.

Similarly, inhalation risks to the future resident child and the future resident adult/child are not included in the table. When the report is revised, these receptors should be incorporated.

This table seems to reflect conclusions from the risk assessment performed during the RI. As such, some of the toxicity factors (RfDs and CSFs) presented in the table are dated. A qualitative statement should be added to the table, acknowledging changes to the tox criteria. Note that any remediation conducted at the site will be held to the most current standards for risk.

**Response:** Comment noted on use of all monitoring wells. An updated risk assessment was performed using maximum detected concentrations of COPCs (PCE, TCE, cis-1,2-DCE, trans-1,2-DCE, vinyl chloride, 1,1-DCA, 1,2-DCA, and benzene) detected during August 2014 sampling. Results of

this revised assessment are provided in Section 1.6.4. COCs were identified as TCE and vinyl chloride based upon current site conditions.

Table 2 has been updated to provide only total RME and total CTE risk values. PCE was added to the adult resident receptor. Inhalation risks to the future child resident were not calculated. The inhalation risks for the future adult/child resident are accounted for in the total RME and total CTE values for this receptor.

Toxicity factors (RfDs and CSFs) associated with the SRI HHRA are reflective of values current at the time the risk assessment was conducted (2007/2008). Risks associated with select VOCs were assessed as part of the August 2014 HHRA update. Toxicity factors (RfDs and CSFs) associated with this update are current. As noted in Section 1.6.4 of the FFS, as part of development of this FFS, a review of updated risk-based screening values (November 2013 tap-water RSLs), MCLs, and toxicity values was performed. As a result, 1,1-DCA, chromium, and cobalt were identified as additional COPCs that contribute to an unacceptable risk or hazard in groundwater. Risk management considerations for chromium and cobalt are presented in Table 3. 1,1-DCA was retained as a site COPC, analyzed for during August 2014, and assessed during the August 2014 HHRA update. No unacceptable risks associated with 1,1-DCA were identified.

If you have any questions concerning these responses to comments, please feel free to contact me at (757) 671-6280.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Nat C Price', is positioned above the printed name.

Nathaniel Price, P.E.,  
Project Manager

cc: Mr. Paul Herman/ VDEQ  
Mr. Matthew Stepien/ NAVFAC Mid Atlantic  
Ms. Cecilia Landin/CH2M HILL